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# **UNITED STATES PATENT APPLICATION FOR GRANT OF LETTERS PATENT**

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## **Brick Tie**

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## **BRICK TIE**

### **FIELD OF THE INVENTION**

The present invention relates to brick ties of the type which are used for anchoring a brick wall to a back-up wall including a series of spaced apart studs.

### **BACKGROUND OF THE INVENTION**

It is common practice to provide a building, for example, a light steel framed industrial building, with a brick exterior wall. Since such a brick wall may have considerable length and height, it is necessary to anchor the wall at intervals to an adjoining structure of the building. Such buildings usually also include a back-up wall which typically would include a series of spaced apart studs and some form of a wall board disposed between the studs and the brick wall. For example, it is common to use an exterior gipboard sheathing along with a separate vapor barrier sheet material about the outside of the studs and in the area between the studs and the brick wall.

In the construction of such buildings, the brick wall is built by bricklayers while other tradesmen construct other parts of the building before the brick wall is built. In many cases, to anchor the exterior brick wall, brick ties are secured to the back-up wall by a framing crew or contractor before the brick wall is constructed. Specifically, the brick ties are usually secured to individual studs of the back-up wall and are projected from the studs through the wallboard. Thereafter when the exterior brick wall is constructed, the bricklayers will cause the brick ties to be embedded in mortar between two courses of brick or block.

Brick ties are well known in the art. For example, see the brick ties disclosed in the following U.S. patents: 4,843,776; 6,212,841; 5,636,486; 4,021,990; and 6,209,281. The disclosures of these patents are expressly incorporated herein by reference. In

such prior art, the brick ties are connected to the back-up wall structure in a variety of ways. Some of the brick ties are actually secured to the metal studs and then are projected through the adjacent wallboard such that the tie component lies exterior of the wallboard for use by a brick mason. Therefore, one of the main drawbacks to brick ties of the prior art is that they have been difficult to implement in a wall structure, and as noted above, sometimes requiring two different tradesmen in order to mount and complete the tying or anchoring arrangement.

Therefore, there has been and continues to be a need for a relatively simple brick tie that is easy to install and which can be installed and completely implemented by a brick mason.

## **SUMMARY OF THE INVENTION**

The present invention entails a brick tie that is adapted to be interconnected between a brick wall and a back-up wall having a series of spaced apart studs and a wallboard secured to the studs wherein each stud includes a pair of spaced apart flanges and a web extending between the flanges. The brick tie comprises a plate adapted to fit flush against the wallboard with the plate including a backside and a front side. A series of spikes project outwardly from the backside of the plate for projecting into the wallboard and at least partially securing the plate to the wallboard. Fastener openings are provided in the plate and a series of fasteners project through the fastener openings and into the wallboard and into a flange of a stud for securing the plate to the stud. A tie holder or opening is formed on the front side of the plate and a tie is secured to the tie holder and freely movable up and down therein. The tie secured by the tie holder is adapted to project outwardly from the plate such that a brick mason may insert the tie between two courses of brick in the brick wall so as to anchor the brick wall to the back-up wall.

Another aspect of the present invention entails providing a brick tie that can be easily secured to the back-up wall. This aspect of the present invention entails providing the brick tie with a plate and a series of spikes that project from a backside of the plate. When implemented, the spikes are utilized to project directly into the wallboard forming a part of the back-up wall.

In this same regard, the present invention entails a method of securing a brick tie between a brick wall and a back-up wall. This method comprises securing a plate of the brick tie to the wallboard by providing the series of spikes wherein the spikes project from the backside of the plate and project into the wallboard so as to support the brick tie on the wallboard by the position of the spikes penetrating the wallboard. In this method, the plate of the brick tie is secured to the wallboard in alignment with a stud. More particularly, the plate is secured to the wallboard such that the one or more fasteners can be extended through the plate, through the wallboard and directly into a side flange of an aligned stud.

Other objects and advantages of the present invention will become apparent and obvious from a study of the following description and the accompanying drawings which are merely illustrative of such invention.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is a perspective view of a wall section showing the brick tie of the present invention being mounted directly to the wallboard and a particular stud.

Figure 2 is a front elevational view of the brick tie.

Figure 3 is a side elevational view of the brick tie.

Figure 4 is a front elevational view of an alternative embodiment for the brick tie.

Figure 5 is a side elevational view of the brick tie shown in Figure 4.

Figure 6 is a cross sectional view of a brick wall and back-up wall section showing the brick tie interconnecting the back-up wall with the brick wall.

Figure 7 is a perspective view of an alternate embodiment for the brick tie of the present invention.

Figures 8 and 9 show another alternate embodiment for the brick tie of the present invention.

Figure 10 illustrates a fastener for securing the brick tie to a support structure.

### **DESCRIPTION OF EXEMPLARY EMBODIMENTS**

With further reference to the drawings, the brick tie of the present invention is shown therein and indicated generally by the numeral **10**. As seen in Figure 1, a series of brick ties **10** is incorporated into a wall structure that includes a brick wall indicated generally by the numeral **14** and a back-up wall indicated generally by the numeral **14**. The back-up wall **14** is of a conventional construction and includes a wallboard **16** and a series of spaced apart studs **18** secured, as viewed in Figure 1, behind the wallboard **16**. Wallboard **16** can be of any conventional board structure that is utilized between the studs and a brick veneer wall. For example, the wallboard may be a structure known as gipboard. In any event, the wallboard is secured directly to the studs **18**. The studs **18** are also of a conventional design utilized in metal walls. As illustrated in Figure 1, each stud includes a pair of opposed flanges **18A** and a web **18B** extending between the opposed flanges.

Turning to the brick tie **10**, it is seen that it basically comprises a plate **20**. Plate **20** includes a front side and a backside. A series of openings **22** are formed in the plate **20**. A series of spikes **24** project outwardly from the backside of the plate **20** generally normal to the plate. In this particular embodiment, the openings **22** and the spikes **24** are generally triangularly shaped. That is, in forming the spikes **24**, the plate **20** is

partially cut along two sides of the triangular openings **22**. The portion of the plate between the cuts is then bent out of the plane of the plate **20** to form the spikes **24**. It should be appreciated that the spikes **24** may be assume various shapes or secured to the plate in other ways.

Formed in the plate **20** are a series of fastener openings **26**. The fastener openings **26** are strategically placed about the plate such that the plate can be firmly secured to a stud **18**. In the case of the embodiments illustrated in Figures 2 and 4, the fastener openings include five openings as shown. A different number of openings could, of course, be provided. To secure the plate **20** to the back-up wall **14**, there is provided a series of fasteners. In the case of the embodiments illustrated herein, as indicated in Figure 6, the fasteners are in the form of screws **28**. Screws **28** are adapted to be extended from the front face of the plate **20** through the fastener openings **26**, through the wallboard **16** and directly into a side flange **18A** of a respective stud. That, of course, means that in securing the plate **20** to the wallboard **16**, that the plate is specifically aligned with a flange **18A** of a stud lying on the opposite side of the wallboard **16**. Various types of fasteners **28** can be utilized. Figure 9 illustrates one particular screw type fastener that would be effective in securing the plates of the brick ties disclosed herein to the backup board **14** and to the stud structures lying behind the back up wall **14**. Fastener **29** shown in Figure 10 includes a drill type end **28A**. Between end **28A** and the head of the screw **28**, there is provided a series of aggressive threads **28B**. A fastener such as illustrated in Figure 10 will effectively secure the brick ties **10** to the backup wall **14** and the flanges **18A** of the studs.

Formed on the front side of the plate **20** is a tie holder structure. The tie holder includes a slot indicated by the numeral **30**. There are two embodiments for the slot **30** disclosed herein. In Figure 3, for example, the slot **30** is generally elongated and extends about a substantial length of the plate **20**. In the embodiment of Figure 5, the

slot **30** is somewhat more rounded and of a height or length less than the slot **30** of the Figure 3 embodiment.

In any event, a tie indicated generally by the numeral **32** is inserted in or confined within the slot **30**. In the case of either embodiment, the tie **32** can be substantially adjusted within the confines of slot **30**. That is, the tie **32** can be raised or lowered up and down in the slot **30** such that the tie is disposed at an appropriate level to be inserted between two courses of brick. See for example, Figure 6.

Each tie **32** assumes a generally V-shape and includes a pair of diverging arms **34**. Each arm includes an end portion that is bent or turned inwardly as illustrated in Figures 2 and 4. These turned or bent in ends **36** are generally disposed opposite each other and are aligned.

In using the brick tie **10** of the present invention, it is important to appreciate that before the brick tie is secured to the wallboard **16**, that the plate **20** should be aligned with a stud **18** disposed on the opposite side of the wallboard. That is, the plate **20** should be properly aligned with the stud **18** such that when the fasteners **28** are extended through the plate **20** that the fasteners will engage and be secured into the flange **18A** of the aligned stud. In any event, when the brick tie **10** is properly aligned, a brick mason or other individual can simply press the plate **20** into the wallboard. This, of course, causes the spikes **24** to penetrate the wallboard and secure the plate in a firm position on the wallboard **16**. Thereafter, the screws or fasteners **28** are extended through the fastener openings **26**, through the wallboard **16** and into the flange **18A** of the aligned stud **18**. In other words, the screws or fasteners **28** are screwed into the side flange **18A**. Now that the plate **20** has been securely anchored to the back-up wall **14**, the brick mason can vertically adjust the tie **32** to a proper position with respect to a course of brick or block. It is desirable, as indicated in Figure 6, for the tie **32** to extend outwardly from the plate **20** at an angle of approximately 90°. This will, of course, vary in

some applications. However, the provision of the slot **30** will enable the brick mason to adjust the tie **32** with respect to the course of brick such that the tie can be extended generally normal from the plate **20**. Therefore, as shown in Figure 1, the tie is extended outwardly over a course of brick. Then a second course of brick is placed over the underlying course of bricks such that the tie, along with intervening mortar, is sandwiched between the two courses of brick. As used herein, the term brick, is utilized to mean any type of masonry product including, for example, concrete blocks.

As seen in Figure 6, the brick tie interconnects the brick wall **12** with the back-up wall **14**. By interconnecting the brick tie with both the wallboard and a stud, it is seen that the connection formed is a strong connection that will anchor the brick wall **12**.

Turning to Figure 7, an alternative embodiment for the brick tie is shown therein and indicated generally by the numeral **10**. The Figure 7 embodiment is generally similar to the embodiments discussed above, but there are some structural distinctions. Viewing the embodiment of Figure 7, the brick tie includes a plate or back **20**. A series of openings **22** are formed in the plate. In the case of this embodiment, the openings **22** are generally triangularly shaped and in the process of forming the openings **22**, a spike **24** is formed. The spikes **24** project outwardly from the backside of plate **20**.

An opening **30** is formed in the plate **20**. Projecting outwardly from the front of the plate **20** is a retainer **31**. Note that the retainer **31** extends outwardly in front of the opening **30**. As discussed below, retainer **31** functions to hold the tie indicated generally by the numeral **32**. The tie **32** includes an arm **34**. About the inner end of the arm **34** there is formed an angled slot **40**. In the case of the embodiment shown in Figure 4 the angled slot **40** assumes a generally Z-shaped configuration. Note in Figure 7 where the angled slot **40** includes a portion that extends partially around the retainer **31**. In any event, it is clear that the tie **32** can move up and down on retainer **31** while the slot **40** generally confines or connects the arm **34** to the retainer **31**. Disposed on the outer end



portion of arm **34** is a series of ridges or ribs **42**. The presence of ridges **42** assist in securing the tie **32** within the mortar between overlying bricks.

Again with the embodiment of Figure 7, the tie **32** can be easily connected and disconnected to the retainer **31** and can be adjusted at various heights with respect to the brick tie **10**.

Turning to Figures 8 and 9, yet another embodiment for the brick tie of the present invention is shown therein. There is a slight difference between the designs of Figures 8 and 9, but for the most part the two designs are similar. Viewing Figure 8 first, there is shown therein a brick tie indicated generally by the numeral **10**. Brick tie **10** includes a plate **20**. Plate **20** includes a series of openings **22**. In the process of forming openings **22**, a series of spikes **24** are formed. Spikes **24** project rearwardly from the back side of the plate **20** into a back wall indicated generally by the numeral **14** in Figure 1. In addition, plate **20** includes a series of other openings indicated by the numeral **26**. These openings are adapted to receive a fastener, of the type shown in Figure 10 and indicated generally by the numeral **28**. In this particular embodiment, fastener **28** includes a penetrating end **28A** and a series of relatively large threads **28B**. That is, a fastener **28** is projected through respective openings **26** into the backup wall **14**.

Plate **20** includes a raised central portion **27**. That is, as viewed in Figure 8, it is seen that a central portion of the plate **20** is indented or raised outwardly. Formed in the raised central portion **27** is an elongated slot **29**. As seen in Figure 8, the elongated slot **29** includes a surrounding edge.

A tie, indicated generally by the numeral **32**, is confined within the slot **29**. As will be appreciated from subsequent portions of the disclosure, the tie **32** is movable up and down, as viewed in Figure 8, within the slot **29**. Moreover, the tie can be easily inserted into the slot **29** or removed therefrom.

Tie **32** includes an arm **34**. Arm **34** assumes a generally L-shaped configuration. Basically arm **34** includes two main sections, a first section **34A** and a second section **34B**. A reinforcing rib **34C** is formed in the second section **34B**. A portion of the arm **34** extends into and is confined within the slot **29**. In particular, the arm **34** includes an end portion **34D** that projects into slot **29**. Formed in the end portion **34D** is a pair of opposed notches. The notches, as illustrated in Figures 8 and 9, are sized to accept a portion of the surrounding edge of the slot **29**. Therefore, when the arm **34** is oriented as shown in Figure 8, the notches confine the arm **34** within the slot **29**. Note that the arm **34** can move up and down in the slot **29**. To remove the arm **34** from the slot **29**, the arm **34** can be rotated 90° such that the end portion **34D** aligns with the slot **29**, permitting the end portion **34D** to be removed from the slot.

Formed along the arm **34** is a series of protrusions or cleats **34E**. This imparts some aggressiveness to the arm **34** and contributes to the securement of the tie **32** within a layer of mortar disposed between two courses of brick.

The embodiment of Figure 9 is substantially similar to Figure 8 except that the brick tie of Figure 9 is more narrow. In the case of the embodiment of Figure 9, the triangular shaped openings **22** would still produce a spike that would extend from the back of the plate **20** into a back up wall **14**. However, to provide additional securement, a fastener **28** can be inserted and projected through the openings **22** into the backup wall **14**. In any event, the brick tie **10** shown in Figure 9 is utilized in the same manner as described above. That is, the arm **34** projects from the slot **29** into a layer of mortar, thereby securing an adjacent brick wall at the spaced apart points.

From the foregoing specification and discussion, it is seen that the brick tie **10** of the present invention is generally simple in design and can be easily and economically manufactured. Also, the brick tie **10** is designed such that it can be totally installed by a single tradesman, namely a brick mason.

The present invention may, of course, be carried out in other specific ways than those herein set forth without departing from the scope and the essential characteristics of the invention. The present embodiments are therefore to be construed in all aspects as illustrative and not restrictive and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.